

MAVEN Targeting Mars

Transcript:

[ambient sound] If you want to send a spacecraft from Earth to Mars, how would you get it there? You can't aim straight at the Red Planet because it's moving around the Sun almost 13,000 mph slower than the Earth. Instead, you'll have to wait for up to 26 months for the Earth and Mars to be in just the right spot in their orbits, then carefully aim at a moving target. In November 2013, the controllers of NASA's Mars Atmosphere and Volatile Evolution mission, or MAVEN, did just that, launching the Mars-bound orbiter from Cape Canaveral, Florida on an Atlas V rocket. After separating from the rocket and the Centaur upper stage, MAVEN unfolded its solar arrays, pointed them at the Sun, and embarked on a ten-month cruise to Mars. The launch sent MAVEN arcing outward on a path called a transfer orbit, which will intersect with the orbit of Mars on September 21, 2014. By starting its journey when the Earth was behind Mars, MAVEN has been taking advantage of our planet's greater speed to catch up to its target. When MAVEN arrives, it will not be automatically captured by Mars's gravity, but will instead need to perform an engine burn to change its velocity by over 2,700 miles per hour. Just before Mars Orbit Insertion, the spacecraft will turn its thrusters in the direction of travel, then MAVEN will fire its engines for thirty-three minutes. The engine burn will slow MAVEN's velocity, allowing Mars's gravity to take over, and pulling the spacecraft into an elongated 35-hour orbit. In the following weeks MAVEN will reduce its orbit to four-and-a-half hours, then it will deploy its science instruments and begin collecting data. MAVEN's findings will reveal how Mars changed from a warm, wet planet early in its history, to the cold, dry world we see today, shedding light on one of the solar system's biggest mysteries. [music] [satellite beeping]